Box B
Reply to Martinez and Cushing

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There is no doubt that the niche model (N) is excellent at describing standard food web properties, and we do not contest that N can perform better than our nested-hierarchy model (NH) for some properties in some observed food webs. There are however two important points that must be considered. First, observed values for standard properties always fall within the range predicted by NH; N may be better than NH in some instances, but NH always provides an adequate fit. Second and more fundamentally, N completely fails in the description of real food webs in that it generates only contiguous diets. This structural feature, captured by the property Ddiet, is never observed in recent and highly resolved food webs (Ddiet is fundamental because it is closely related to the organization of the food web). This failure leads us to reject N and points out that its basic assumption is wrong.

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By constraining all consumers to be ordered along a single niche dimension, N may more aptly describe taxonomically defined sub-systems. Only our niche-hierarchy model, which postulates that the evolutionary history of the species comprising the food web underlies its organization, fully captures the complexity and variability of real food webs.